



A Case of Binocular Vertical Diplopia after Intratympanic Gentamicin Therapy

Giacomo Maria Cioffi¹, [Francesca Irene Rampolli](#)¹, Emmanuela Pareti¹, Nicola Melik², Francesco De Righetti³

¹Department of Internal Medicine, Ospedale La Carità di Locarno, Switzerland

²Department of Otorhinolaryngology, Ospedale La Carità di Locarno, Switzerland

³Department of Otorhinolaryngology, Clinica Sant'Anna, Lugano, Switzerland

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ABSTRACT

Intratympanic gentamicin therapy is a useful alternative treatment for refractory Meniere's disease and is generally well tolerated. Visual disturbances as side effects of this treatment are rarely reported in the literature. In this report we describe the case of a 52-year-old woman with refractory Meniere's disease who developed binocular vertical diplopia following intratympanic gentamicin therapy. Spontaneous resolution of diplopia occurred within 2 weeks. The development of diplopia should be discussed as a potential complication with patients undergoing intratympanic gentamicin therapy.

LEARNING POINTS

- Meniere's disease is an inner ear disorder which can cause vertigo and hearing loss.
- As medical treatment sometimes fails, other therapeutic options should be considered.
- Gentamycin chemical labyrinthectomy can be administered as an alternative treatment, but the development of diplopia should be discussed as a potential side effect.

KEYWORDS

Meniere's disease, diplopia, intratympanic gentamicin

INTRODUCTION

Meniere's disease is an inner ear disorder characterized by attacks of vertigo, fluctuating and progressive hearing loss, tinnitus and aural fullness in the affected ear. Medical treatment includes a low-salt diet, vasodilators, diuretics, and symptomatic therapy for nausea and diaphoresis. However, when medical treatment fails, other therapeutic options must be considered^[1]. Chemical labyrinthectomy with gentamicin is a minimally invasive procedure and a useful alternative treatment. Although it is considered safe and is usually well tolerated, it can be prone to complications such as deafness, perforation of the tympanic membrane or permanent vestibular dysfunction. Vision disorders are rare: there are only four published cases of diplopia due this treatment. In this report, we describe a case of binocular vertical diplopia after intratympanic gentamicin injection for the treatment of intractable Meniere's disease.

CASE DESCRIPTION

The patient was a 52-year-old woman with a 6-year history of right-sided Meniere's-like syndrome, atypical for the absence of cochlear participation and associated with episodic vertigo, loss of balance and nausea. Previous audiometric tests were normal, while caloric tests showed only minimum right vestibular hypofunction. Treatment with betahistine first and then prednisolone failed to provide relief.

In 2015 the patient presented with a prolonged episode of vertigo, which was treated with prednisolone 50 mg without success and with persistence of the vertigo accompanied by headache. On that occasion, MRI of brain did not show any emergent lesions. The patient later underwent tympanic drainage and in 2017 was treated with systemic steroids. Intratympanic steroids were also administered without benefit.

On 15 November 2017, the patient received an injection of intratympanic gentamicin (16 mg/ml) into her right middle ear space. Three days later, she described an exacerbation of her vertigo, accompanied by a clogged sensation in her right ear.

On 24 November 2017, she reported waking up with persistent binocular vertical diplopia, instability with head movement, difficulty appreciating her visual environment, and deafness at high frequencies. The patient was admitted to our emergency department. At admission she had spontaneous nystagmus towards the left side. The skew test and head impulse test were normal. Extensive laboratory investigations were carried out to rule out metabolic, infectious, endocrine and autoimmune causes. Brain MRI showed no central or vascular lesions. A complete ophthalmic and orthoptic examinations were performed and did not reveal any central or peripheral pathology. Transient antiplatelet treatment and symptomatic therapy were administered with gradual improvement of the patient's general condition and she was discharged.

An ear-nose-throat examination performed 2 weeks after her discharge demonstrated resolution of the diplopia.

DISCUSSION

Meniere's disease is a chronic condition caused by a disorder of endolymphatic labyrinth regulation, characterized by recurrent attacks of vertigo, tinnitus, a feeling of fullness in the ear, and sensorineural hearing loss.

Intratympanic injection of gentamycin is a non-surgical treatment for patients with unilateral Meniere's disease who are refractory to other medical treatment^[2].

We identified four cases in the literature where visual disorders following intratympanic gentamicin injection were reported. In these patients, symptoms began an average of 4 days (range 3–5 days) after injection^[3–6].

The onset of vertical diplopia in our patient occurred about 9 days after injection, with no skew deviation, probably due to a subtle right ptosis. This period is longer than those reported in other cases in the literature. Spontaneous resolution of the diplopia occurred within 2 weeks in our patient, earlier than the 6–8 weeks reported in the other cases, with persistent rightward gaze, vertigo and balance instability. The HINTS (Head Impulse, Nystagmus, Test of Skew) test, often used to assess vertigo in the context of acute vestibular syndrome, is a three-step neuro-otological examination evaluating for a normal head impulse test, direction-changing nystagmus, or skew deviation as highly sensitive markers for acute ischaemic stroke^[7, 8]. Our patient had a peripheral lesion, as demonstrated by the peripheral nature of the nystagmus, the course of the disease, and the absence of brain MRI lesions. This suggests that neuroradiological examinations are not required in all patients with visual disorders or skew deviation if it is known to be peripheral or caused by gentamycin injection^[6].

In conclusion, we report the case of a patient who developed binocular vertical diplopia after gentamicin injection without neurological findings and confirm that visual alterations are rare complications of this treatment for Meniere's disease. In accordance with the principles of ocular innervation, the eye ipsilateral to the injected ear was hypotropic in all reported cases^[6].

We therefore recommend that patients should be informed of this potential complication of intratympanic gentamicin injection and that clinicians should be aware of the physical findings that may accompany this syndrome.

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